

STUDY ON THE GENUS SWAMMERDAMIA HÜBNER (LEPIDOPTERA, YPONOMEUTIDAE) FROM CHINA, WITH DESCRIPTIONS OF TWO NEW SPECIES

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Abstract This paper deals with four species of the genus *Swammerdamia* Hübner. *S. zhengi* sp. nov. and *S. caudinigra* sp. nov. are described as new to science. *S. caesiella* (Hübner) is recorded for the first time from China. A key to the Chinese species in the genus and photographs of the new species are provided.

Key words Lepidoptera, Yponomeutidae, *Swammerdamia*, new species, China.

The genus *Swammerdamia* was erected by Hübner in 1825. It is a small genus mostly recorded in the Holarctic Region. Three species occur in North America, but two of them are Holarctic species and only one of which is endemic (Hodges *et al.*, 1983; Doganlar, 1979). Nine species have been known in the Palearctic Region and one is endemic to Madagascar (Friese, 1960; Gibeaux, 1984; Gershenson, 1981, 1997; Gershenson & Ulenberg, 1998; Junnilainen, 2001). To date, eleven species have been recorded worldwide in the genus. One of these species, *Swammerdamia pyrella* (de Villers, 1789), was reported to occur in China previously (Moriuti, 1977; Liu, 1981).

In the present paper, we describe two new species and report one species from China for the first time. The type specimens are deposited in the Insect Collection, College of Life Sciences, Nankai University, Tianjin, China.

Swammerdamia Hübner, [1825]

Swammerdamia Hübner, [1825]. *Verz. bek. Schmett.*: 425. Type species: [*Phakania Tinea pyrella* de Villers, 1789 =] *Tinea caesiella* Hübner, 18 [10 13].

Swammerdamia Heinemann, 1870. *Schmett. Deutsch.* 2 Abt. 2 (1): 104, no. 402 (amended spelling for *Swammerdamia*).

Macrophanta Meyrick, 1932. *Exot. Microlep.*, 4: 339. Type species: *Macrophanta caulosma* Meyrick, 1932.

Moriuti (1977) redescribed the genus in detail. The adult has a large or small hyaline space on hindwing in the Chinese specimens. Two species described in this paper have similar small lateral teeth near apex of aedeagus as some of the European species (Agassiz, 1996).

Host plants. Betulaceae: *Betula* sp.; Rosaceae: *Prunus* sp., *Crataegus* sp., *Cydonia* sp., *Malus* sp.; Fagaceae: *Castanea* sp.

Distribution. Holarctica, Madagascar.

Key to the species of the genus Swammerdamia from China

1. Forewing maculation indistinct except costal edge with a small white spot at distal 1/6 2
Forewing basally with dark stripe along inner margin, distal 1/6 black; sacculus with about 15 scattered strong spines; ostium large, lamella postvaginalis composed of a pair reniform processes *S. caudinigra* sp. nov.
2. Aedeagus shorter than genitalia; ductus bursae shorter than abdomen 3
Aedeagus longer than genitalia; ductus bursae longer than abdomen *S. caesiella* (Hübner)
3. Sacculus with two spinous clusters, bearing five to six and ten large spines respectively; part of ductus bursae with carinae longer than entire ductus bursae; signum longitudinal, somewhat rhomboid *S. zhengi* sp. nov.
Sacculus with one to two large spines; part of ductus bursae with carinae shorter than entire ductus bursae; signum transverse *S. pyrella* (de Villers)

Swammerdamia caesiella (Hübner, 1796) New record to China

Tinea caesiella Hübner, 1796. *Samml. Eur. Schmett.*, 8: 65, Tin., pl. 25, f. 172.

Swammerdamia caesiella: Frey, 1856. *Tinea Pteroph. Schweiz.*, 55.

Swammerdamia caesiella: Heinemann, 1870. *Schmett. Deutsch.* 2 Abt., 2 (1): 105.

Swammerdamia herddella Hübner, 1825. *Verz. Bek. Schmett.*, 425, no. 4187 (new name for *caesiella* Hübner, 1796).

Lia heroldella: Treitschke, 1833. *Schmett. Eur.*, 9 (2): 97.

Tinea herddella: Duponchel, 1838. *Hist. Nat. Lep. France*, 11: 109 pl. 289, f. 5.

Swammerdamia herddella Hübner, [1825]. *Verzeichniss bekannter Schmetterlinge*, Augsburg: 425.

Tinea nubeculella Tengstrom, 1848. *Notis Sallsk. Fann. Flora Fennica Forh.*, 1: 112.

Tinea griseocapitella Stainton, 1851. *Cat. Brit. Tineid. Pterophorid.* Sppl.: 3.

Swammerdamia griseocapitella: Stainton, 1854. *Ins. Brit. Tineina*: 56; Herrich-Schäffer, 1855.

Schmett. Eur., 5: 281, f. 642; Stainton, 1870. *Schmett. Deutsch.*, 2 Abt. 2 (1): 107.

Swammerdamia castaneae Busck, 1914. *Proc. Ent. Soc. Washington*, 16: 148.

Swammerdamia aspresens Braun, 1918. *Can. Ent.*, 50: 231.

Wingspan 11.5 mm.

Material examined. 1 ♂, Xiaowutai, Weixian, Hebei Province, 1 500 m, 25 July 2000, leg. DU Yur Li and LI Zhen Dong.

Host plants. *Betula* sp., *Alnus* sp., *Castanea dentata* Borkh.

Distribution. China (Hebei), Japan, Russia (Far East), Europe, North America.

Swammerdamia pyrella (de Villers, 1789)

Phaenicia Tinea pyrella de Villers, 1789. *Cardi Linn. Ent.*, 2: 515.

Swammerdamia pyrella: Stainton, 1854. *Ins. Brit. Tinea*, 56.

Swammerdamia pyrella: Heinemann, 1870. *Schmett. Deutsch.*, 2 Abt. 2 (1): 107.

Tinea cerasiella Hübner, 18 [10 13], *Samml. Eur. Schmett.*, 8, pl. 48, f. 332.

Swammerdamia cerasiella: Hübner, 1826. *Verz. Bek. Schmett.*, 425, No. 4147.

Lita cerasiella: Treitschke, 1835. *Schmett. Eur.*, 10 (3): 200.

Tinea cerasiella: Duponchel, 1838. *Hist. Nat. Lep.* 11: 105, pl. 287, f. 6.

Oecophora passerella: Zetterstedt, 1840. *Ins. Lapponia*, 1009.

Swammerdamia passerella: Benander, 1940. *Opusc. Ent. Lund.*, 61.

Swammerdamia variegata Tengstrom, 1869. *Notis. Salsk. Fauna Flora Fennica Forh.*, 10: 364.

Swammerdamia nanivora Stainton, 1871. *Ent. Annual*, 1871: 96.

Argyresthia sapporella Matsumura, 1931. 6000 Ill. *Ins. Japan*, 1096, no. 2264.

Host plants. *Prunus salicina* Lindley, *P. communis* L., *P. cerasus* L., *P. domestica* L., *P. avium* (L.), *P. siori* Schm., *Crataegus* sp., *Cydonia obdonia* Mill., *Betula nana* L., *B. pendula* Roth., *Malus praecox* Borkh., *M. silvestris* Mill. (Gershenson and Ulenberg, 1998).

Distribution. China (Henan), Japan, Russia (Far East), Europe, North America.

Swammerdamia zhengi sp. nov. (Figs. 1, 3, 5, 7, 9)

Adult (Fig. 1). Wingspan 11.0–15.0 mm. Head white, with long scales. Face grayish brown, smooth. Antenna: scape white, pecten white but distal half brown; flagellum dark brown, with narrow grayish annuli. Labial palpus grayish white, second segment with scattered brown scales on outer surface; porrect or slightly drooping. Thorax grayish white with scattered pale brown to dark brown scales, posterior end with large black tuft. Tegula slightly darker than thorax. Forewing with costal margin gently arched, apical angle pointed, outer margin oblique; ground colour grayish brown, with interrupt dark brown wide fascia from costal 2/5 to 2/5 of posterior margin, forming large spot at middle of cell and at 2/3 of fold; costal edge with a white spot at distal 1/6; cilia gray on posterior margin, pale brown to dark brown on outer margin. Hindwing and cilia gray, hyaline space small and narrow. Legs dark brown, mid and hind tibiae grayish brown. Abdomen grayish brown.

Male genitalia (Figs. 3, 5). Socius slightly longer than half of tegumen, its apical half slender, apex with short thorn. Tegumen with caudal margin produced, anterior margin deeply concave at middle. Gnathos with

narrow cingulum arm, about half of tegumen in length; ventral plate as long as 1/4 of gnathal arm, densely with denticles. Valva moderate, transtilla slender; sacculus broad, apical margin protruded, with two spinous clusters, inner one composed of 5–6 long strong spines, outer one with about ten short spines. Saccus slender, clavate, as long as tegumen. Aedeagus arched, about 1.3 times as long as valva, with small teeth near apex laterally; cornuti consisting of two large and several tiny spines.

Female genitalia (Figs. 7, 9). Papilla analis broad. Apophysis posterior longer than apophysis anterior. Antrum short and broad. Lamella postvaginalis well sclerotized, produced into a pair of oblong lobe-like processes connected at middle, with hairs on caudal margin. Ductus bursae about twice length of apophysis posterior, its posterior 3/4 sclerotized, densely with rough carinae; anterior 1/4 membranous, gradually broadened. Corpus bursae large, nearly rounded, shorter than ductus bursae; signum large, somewhat rhomboid, densely with denticulate processes.

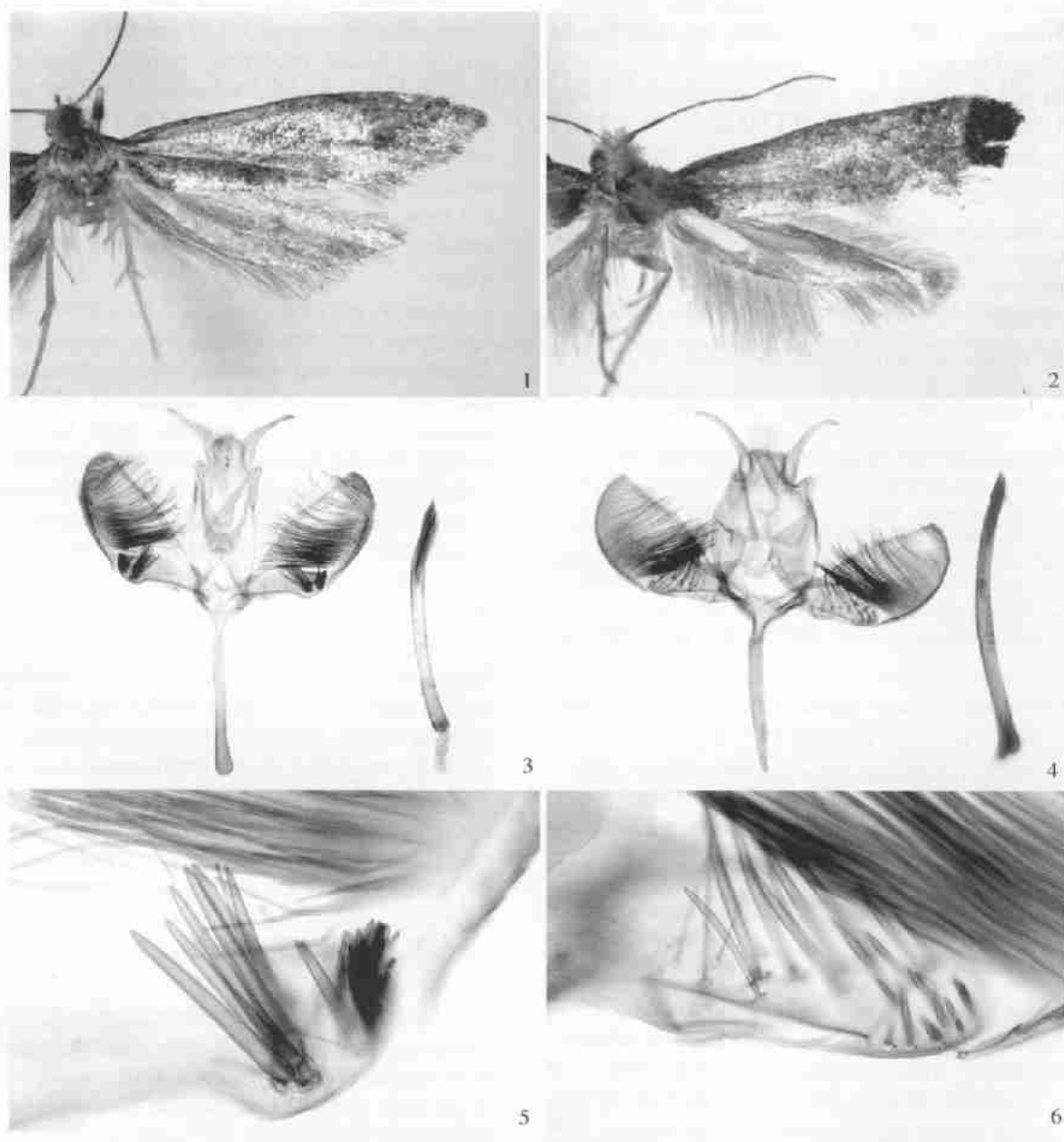
Type material. Holotype ♂, China, Mt. Xinglong (34°25' N, 105°43' E; alt. 2 130 m), Yuzhong County, Gansu Province, 31 July 1993, leg. LI Hour-Hun, genitalia slide No. FXM07001. Paratypes: 1 ♂, 14 ♀♀, 30 July 2 Aug. 1993, same data holotype; 1 ♂, 2 ♀♀, Chengcheng (35°11' N, 109°56' E; alt. 1 000 m), Shaanxi Province, 7 July 1987, 11 Aug. 1993, leg. LI Hour-Hun; 1 ♂, Dahua (36°43' N, 101°17' E), Huangyuan, Qinghai Province, 18 Aug. 1995, leg. ZHU Lan-Fang; 1 ♂, Neiqiu (37°18' N, 114°31' E; alt. 670 m), Hebei Province, 28 July 2000, leg. YU Hai-Li.

Diagnosis. This new species resembles *Swammerdamia pyrella* (de Villers). It can be distinguished from the latter by the sacculus with two spinous clusters in the male genitalia, the lamella postvaginalis larger and the signum rhomboid in the female genitalia.

Etymology. This species is named in honor of Professor ZHENG Zhe-Min for his outstanding contribution to the taxonomic study of insects.

Swammerdamia caudinigra sp. nov. (Figs. 2, 4, 6, 8, 10)

Adult (Fig. 2). Wingspan 12.5–15.0 mm. Head white. Face dark brown, with rough and large scales. Antenna: scape white, pecten white with distal half or entirely dark brown; flagellum dark brown, with grayish brown annuli. Labial palpus brown, third segment with inner surface and apex white, porrect. Thorax grayish white, scattered with brown scales, posterior margin black with tuft at end. Tegula grayish white, outer margin dark brown. Forewing with costal margin nearly straight, apical angle bluntly pointed, outer margin oblique; ground colour grayish brown, with dark stripe



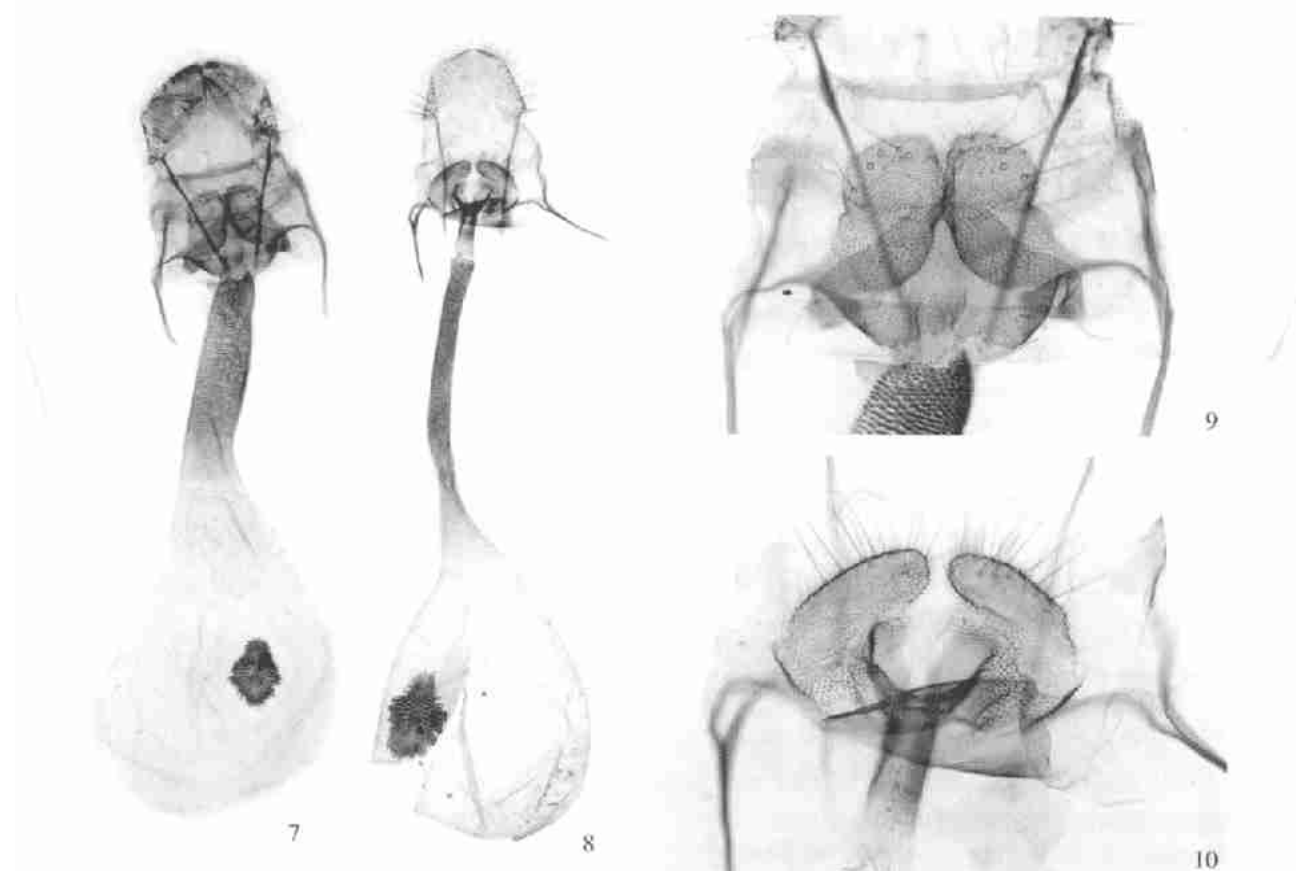
Figs. 1-6. *Swammerdamia* spp. 1-2. Adults. 1. *S. zhengi* sp. nov., ♂paratype. 2. *S. audnigra* sp. nov., ♂paratype. 3, 5. Male genitalia of *S. zhengi* sp. nov., holotype (5. Sacculus enlarged, genitalia slide no. FXM07001). 4, 6. Male genitalia of *S. audnigra* sp. nov., holotype (6. Sacculus enlarged, genitalia slide no. FXM07029).

along inner margin basally, distal 1/6 black; costal edge with a small inconspicuous white spot at distal 5/6; cilia grayish white on posterior margin and black on outer margin. Hindwing and cilia gray, hyaline space large, about 1/4 as wide as and 1/3 as long as hindwing. Fore and mid legs dark brown except tibiae gray, hind leg grayish white. Abdomen gray.

Male genitalia (Figs. 4, 6). Socius slender, about half length of tegumen, apex with short thorn. Tegumen with caudal margin straight, anterior margin deeply concave at middle. Gnathos with narrow cingulum arm, about half length of tegumen; ventral plate ligulate, membranous. Valva short and broad, transtilla sinuate

and joint; sacculus large, scattered with about 15 strong spines. Saccus slender, gradually narrow, as long as tegumen. Aedeagus slightly arched, twice as long as valva, with small teeth near apex dorsally and minute spines at middle ventrally; cornuti composed of cluster of tiny spines.

Female genitalia (Figs. 8, 10). Apophysis posterior 1.5 times as long as apophysis anterior. Antrum narrow, about same length as apophysis anterior, anterior 1/3 membranous. Ostium large, rounded. Lamella postvaginalis well sclerotized, produced into a pair of reniform processes, with hairs on caudal margin. Ductus bursae about twice length of apophysis posterior, densely



Figs. 7-10. Female genitalia of *Swammerdamia* spp. 7, 9. *S. zhengi* sp. nov., paratype (9. Eighth abdomere enlarged, genitalia slide no. FXM07003). 8, 10. *S. caudingra* sp. nov., paratype (10. Eighth abdomere enlarged, genitalia slide no. FXM07033).

with rough carinae; anterior 1/6 membranous, gradually broadened, with tiny carinae. Corpus bursae large, ovate; signum large, irregular rhomboid, densely with denticulate processes.

Type material. Holotype ♂, China, Dashahe (28°53' N, 107°36' E; alt. 1370 m), Daozhen, Guizhou Province, 25 Aug. 2004, leg. XIAO Yurr Li, genitalia slide no. FXM07029. Paratypes: 3 ♂♂, 2 ♀♀, alt. 1350-1370 m, 25-26 Aug. 2004, same data as holotype.

Diagnosis. This new species is different from other known species of the genus by the forewing black in distal 1/6, the hindwing having a especially large hyaline space at base and the sacculus bearing about 15 strong spines on inner side in the male genitalia; the ostium large and the lamella postvaginalis reniform in the female genitalia.

Etymology. The specific name is derived from the Latin prefix *caud-* (caudal) and Latin *niger* (black), referring to forewing with apical 1/6 black.

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腹巢蛾属研究及二新种记述 (鳞翅目, 巢蛾科)*

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摘 要 对中国腹巢蛾属 *Swammerdamia* Hübner, (1825) 进行了研究, 涉及到 4 个种: 桦腹巢蛾 *Swammerdamia caesiella* (Hübner, 1796) (中国新纪录种), 淡腹巢蛾 *Swammerdamia pyrella* (de Villers, 1789), 郑氏腹巢蛾 *Swammerdamia zhengi* sp. nov. 和黑尾腹巢蛾 *Swammerdamia caudinigra* sp. nov.。文中提供了分种检索表和新种特征图。新种模式标本保存在南开大学昆虫标本室。

郑氏腹巢蛾, 新种 *Swammerdamia zhengi* **sp. nov.** (图 1, 3, 5, 7, 9)

新种与淡腹巢蛾 *Swammerdamia pyrella* (de Villers) 相似, 通过雄性抱器腹有两簇刺丛和雌性后阴片大、囊突近菱形可同后者区别。

正模 ♂, 甘肃榆中兴隆山 (34° 25' N, 105° 43' E; 2 130 m), 1993 07 31, 李后魂采, 外生殖器玻片号 FXM07001。副模: 1 ♂, 14 ♀ ♀, 1993 08 02~ 07 30, 其它

采集资料同正模; 1 ♂, 2 ♀ ♀, 陕西澄城 (35° 11' N, 109° 56' E, 1 000 m), 1987 07 07, 1993 08 11, 李后魂采; 1 ♂, 青海湟源大华 (36° 43' N, 101° 17' E), 1995 08 18, 朱兰芳采; 1 ♂, 河北内丘 (37° 18' N, 114° 31' E; 670 m), 2000 07 28, 于海丽采。

词源: 新种以著名昆虫学家郑哲民教授姓氏命名。

黑尾腹巢蛾 (新种) *Swammerdamia caudinigra* **sp. nov.** (图 2, 4, 6, 8, 10)

新种容易与已知种区别: 其前翅端部 1/6 黑色, 后翅近基部有大型透明斑; 雄性抱器腹内面散布大约 15 个强刺, 雌性交配孔大, 后阴片肾形。

正模 ♂, 贵州道真大沙河 (28° 53' N, 107° 36' E; 1 370 m), 2004 08 25, 肖云丽采, 外生殖器玻片号 FXM07029。副模: 3 ♂ ♂, 2 ♀ ♀, 1 350~ 1 370 m, 2004 08 25~ 26, 采集资料同正模。

关键词 鳞翅目, 巢蛾科, 腹巢蛾属, 新种, 中国。
中图分类号 Q96. 426. 1

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